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NOTES ON CEPHALOZIELLA (SPRUCE) SCHIFFNER.

[Read at the Sullivant Moss Society Meeting, Baltimore, 1908.]

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In one of his "Bryologische Fragmente," Schiffner characterizes the above as "die äusserst schwierige Gattung *Cephaloziella*," a comment wherein he is quite justified, as the dioicous species, in particular, at present offer a sufficiently cheerful tangle to anyone desirous of unravelling them.

During the past season the writer's attention has been called to some of the species of this genus, which upon examination resolve themselves into *C. myriantha* (Lindb.) Schiffn., and forms of *C. divaricata* (Sm.) Schiffn. Specimens of both have been examined from different parts of New England, *C. divaricata* being reported from all the New England states, while *C. myriantha* is as yet only from N. H., Mass., and Conn., as well as N. Y.

The two have undoubtedly been confused, probably from lack of fertile material. This is perhaps the reason that *C. myriantha* has been hitherto overlooked in New Hampshire, where it is extremely common in the proper sort of stations. It is emphatically a northern species, and its southern range is not yet definitely known. Its paroicous inflorescence at once distinguishes it from its New England allies.

Lindberg first described *C. myriantha* in the proceedings of the Societas pro Flora et Fauna Fennica, Vol. 1, Feb. 6, 1875, as follows: "in which genus *Cephalozia* the president has found two which he suspected to be undescribed species, one of which, by him named *myriantha*, yet possibly could be identical with *J. rubella* Nees. This first named, which he met with in various places about Ladoga, Helsingfors, Stockholm and Ostergothland, is distinguished without difficulty, in that it is the smallest of the genus, through simple plants, larger and broader leaves, especially toward the apex of the stem, where they are strongly serrate, and consisting of rounded, strongly thickened cells, together with paroicous inflorescence."

Spruce does not pay very much attention to *C. myriantha* beyond quoting Lindberg's northern stations for it, but he describes *C. Jackii* Limpr. at somewhat greater length, and quotes German stations, with notes concerning certain German specimens seen by him.

Warnstorf gives an excellent description of *C. Jackii* in Kryptogamenflora der Mark Brandenburg, p. 230, but makes no mention of *C. myriantha*.

Schiffner, however, in Bryologische Fragmente No. 7, discusses *C. Jackii* and *C. myriantha* in detail, and concludes that they are identical. He says that it was first supposed that *C. myriantha* was the northern, and *C. Jackii* the central European form, but finds among his Norwegian specimens some labelled *C. myriantha*, which are good *C. Jackii*, according to the descriptions.

C. myriantha was first collected in New Hampshire by the Sullivant Moss Society's committee on Mt. Lafayette, during the Appalachian Mountain Club's meeting of July, 1908.

It is common on all the summits about Waterville, N. H., descending also into the valley. It is a true xerophyte, growing on dry exposed barren

soil, and on ledges of rock, mixed with *Polytricha* and lichens. In its most luxuriant form it is dark red, and prostrate, producing in great abundance its capsules, which mature about the first of August. The perianths are whitish and hyaline in the upper part. A heavily fruited patch is quite distinguishable with the naked eye, with a little practice.

One of its colonies looks not unlike one of *Marsupella ustulata*, except that it is dark red instead of almost black. With a lens the creeping stems have the appearance of little chains, like *Temnoma*, the leaves on robust stems being quite imbricated.

The White Mountain specimens are much more robust and deeply colored than those from the trap ledges about Hartford. While equally common, it is green, and but little pigmented, being apt, especially the fertile plants, to grow mingled with tufts of *Leucobryum*.

Dr. Evans says "the paroicous inflorescence may be demonstrated by mounting a stem with a perianth or ♀ inflorescence by itself, crushing it by rubbing the cover glass gently to and fro, and then examining the debris. You will then have little trouble in finding archegonia, and the antheridia, although empty and shriveled, will still show their stalks, consisting of a single row of cells, and their thin and delicate walls."

The lobes of the involucreal leaves of *C. myriantha* are broad, with a narrow sinus, lobes jagged-serrate, and hardly bleached out, except on the outermost edges. Cells very thick-walled. The stem leaves of good robust plants are practically secund, much broader in outline, and with a much narrower sinus than those of *C. divaricata*. *Cellulae minutulae pulchre guttulatae*. Vegetative reproduction by means of oval gemmae on the tips of sterile shoots.

The writer has examined specimens of *C. myriantha* from Mts. Lafayette, Osceola, Tecumseh, Sandwich Dome, Carrigain, and the Scaur, from altitudes ranging from 5300-2300 ft., and from Connecticut stations along the Talcott Range, at an average altitude of 500 ft.

In regard to *C. divaricata* (Sm.) Schiffn. European writers differ as to what is the true *C. divaricata*. Spruce includes in this species many forms, the two most important of which, however, are separated by Warnstorf into *C. divaricata* (Sm.) Warnst. and *C. byssacea* (Roth.) Warnst., distinguished by what would seem good and sufficient characters, as follows:

C. divaricata. Leaf lobes divergent and cell-walls thin, involucreal bracts, with long, narrow lobes, entire or subentire, bleached only on edges, inflorescence elongate-clavate, underleaves only in the inflorescence. Plant of damp localities.

C. byssacea. Leaf lobes broader and with a narrow sinus, cell walls rather thick, but not as much so as in *C. myriantha*, involucreal bracts broader than in *C. divaricata*, spinose-dentate, hyaline in the upper part, cells thick walled. Inflorescence rosette-shaped. Underleaves variable, but present in the inflorescence. Plant of dry ground.

Stephani and Massalongo agree with Warnstorf, but Schiffner does not. "He states that *J. divaricata* Sm. = *J. byssacea* Roth., and keeps Smith's.

name for the plant with spinose-dentate bracts, considering the two species synonyms, and this leaves Warnstorf's *C. divaricata* without any name at all. So he names this *C. trivialis* Schiffn. n. sp., and it is so listed by various other writers. It has not apparently been formally published. Therefore, at present, *C. byssacea* Warnst. = *C. divaricata* Schiffn. while *C. divaricata* Warnst. = *C. trivialis* Schiffn."

Schiffner says "the thickenings of the cell-walls in the species of *Cephaloziella*, according to my previous investigations, vary extraordinarily, according to the damper and shady, or sunny and dry station, and certainly to a high degree depend directly upon the station."

Spruce says of *C. divaricata* (Sm.) "Habitat, on the ground, on stones, or decaying wood, or overrunning other mosses, but always in a humid site, whether shaded or exposed. Probably dispersed throughout the northern temperate zone, in the southern, and between the tropics, replaced by closely related, but distinct species. It abounds equally in plains and mountains, but rarely ascends above the subalpine region."

In Macoun's Catalogue of Canadian Plants, Part VII, 1902, are given numerous stations for *C. divaricata* (Sm.) Dum., ranging from Greenland, Labrador, Nova Scotia, to Lake Superior, Vancouver, British Columbia, and Alaska, but there is no mention of *C. myriantha*.

As, however, in these stations when the habitat is mentioned, it is, "wet places, damp rocks," etc., the specimens may be assumed to be good *C. divaricata* (Sm.) Dum.

In preparing sterile and etiolated forms of *C. divaricata* for examination, it comes up in tufts of parallel stems, looking, on the slide, like minute bunches of asparagus.

Underwood, in Gray's Man. 6 Ed. 1889, does not refer at all to *C. myriantha*, but describes, p. 712, *C. divaricata* (Sm.) according to Spruce. He says however, "dry rocks and sand, pine barrens of N. J. and northward" which seems to point to *C. byssacea* (Roth.) Warnst.

All the fertile specimens collected by the writer in Connecticut apparently should be referred to *C. divaricata* according to Schiffner as they have the spinose-dentate bracts, which is the form listed in the Report on the Conn. Bryophytes. The sterile specimens, from damp rocks, are much etiolated, and might belong to either form.

From the range of stations given, these species are obviously of those who are not unduly particular in the matter of the geological substratum of their habitats. The White Mountains are mostly potassic rocks, with much glacial drift in the valleys, while the trap rocks about Hartford contains a little lime.

Most of these small and, to superficial observation, retiring hepaticae, are most fastidious in their choice of habitat, but, when the combination of characters requisite to their satisfaction is once worked out, the collector has but to put his hand upon them,

Schiffner, in an obituary notice of Limpricht, alludes to Bryology as "diesen liebenswürdigsten Spezialgebiete der *Scientis amabilis* welches aber zugleich zu den schwierigsten gehört." Although this especial genus is confused and vexatious, nevertheless, it is far too interesting to merit neglect.
Hartford, Connecticut.